Electronic Chemistry Publishing: A Librarian's Perspective

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Provision of electronic chemistry journals in an academic setting will be described. The talk will include a historical review, discussion of licensing problems, an analysis of user acceptance and future projections. Caltech's Online Journals list can be browsed or searched from the Library's web page: https://www.library.caltech.edu/

When I think back to my initial reaction to 'electronic' journals, I am a little chagrined. Caltech has, for over 30 years, been providing a comprehensive document delivery service that delivers photocopies of articles (that we have in-house) to our researchers, within a 24-36 hour time frame. For material that we do not own, Interlibrary Loan had been a problem in the past but this has been much improved in recent years and the waiting time has been reduced to 2-3 days or even 2-3 hours in emergencies.

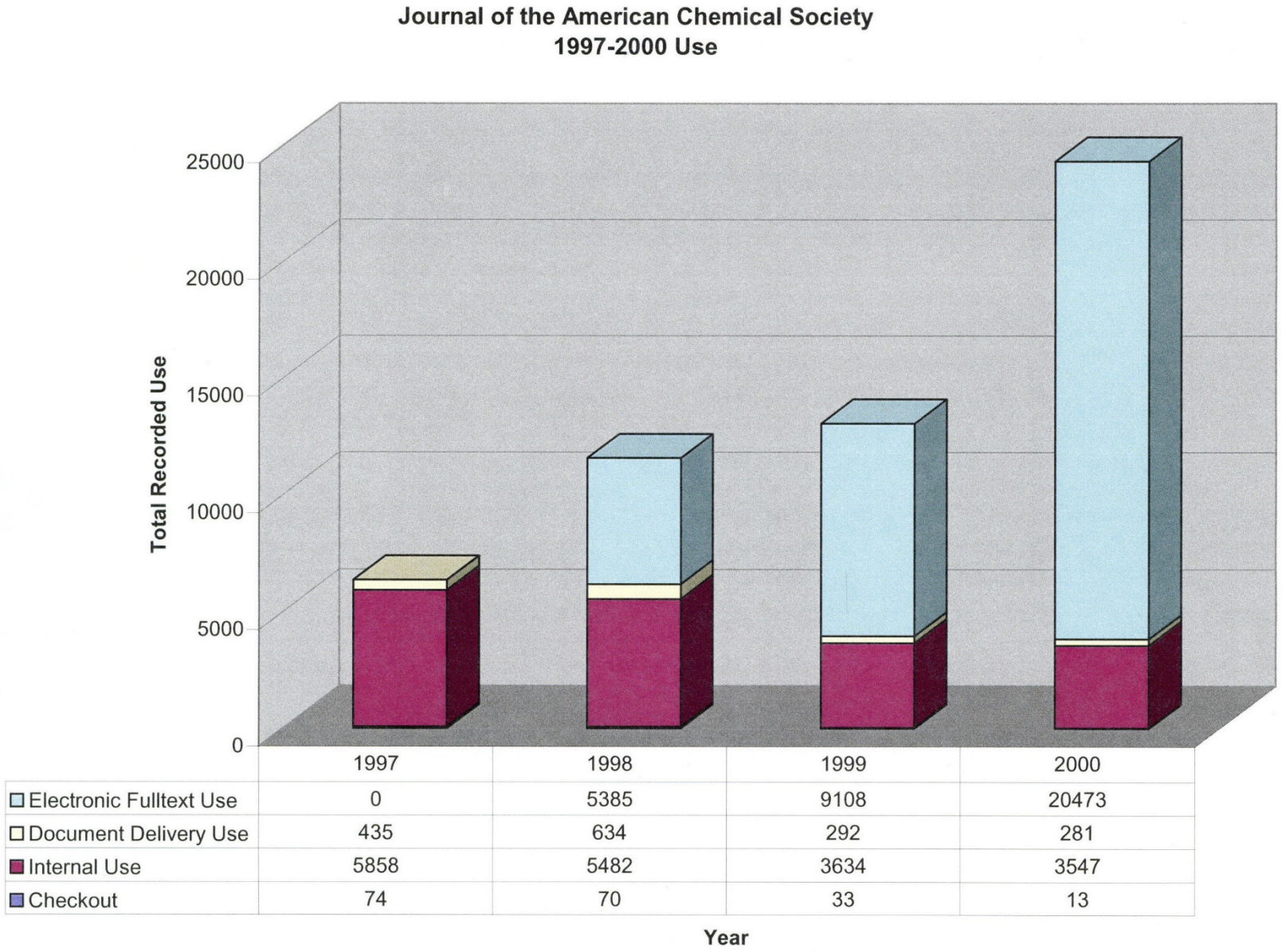
Thus, when the ACS announced the advent of electronic journal in 1997-1998, with what initially seemed like a significant surcharge (25%), my first reaction was somewhat negative. I felt that Caltech's researchers were quite adequately served by a print-based delivery, which was easily accessible from their desk-tops. Caltech's researchers repeatedly expressed their pleasure with this service and didn't seem to mind waiting a short time for their articles. Thus, an extra cost for a duplicate subscription for a seemingly minor additional convenience, a first didn't seem warranted since it would jeopardize other unique purchases.

On reflection, however, I quickly realized that this line of thinking was reminiscent of my initial reaction to spending, in 1988, what seemed like a fortune on an in-house version of what later became ISI's Web of Science. My severe myopia about the significance of providing site-wide access to a comprehensive interdisciplinary journal article database was quickly dispelled by the immediate and overwhelming positive reaction by our faculty and students. Caltech's TOC/DOC service, introduced in 1989, literally changed the way many faculty members conducted their research (1). The ability to 'capture the moment' and quickly locate articles and order photocopies, or review the work of other researchers or laboratories,

instead of making a note to look up something on their next library visit, significantly enhances one's research productivity.

This ability to 'capture the moment' also appears to be the driving force behind the resounding success of many electronic journals. The recent dramatic increase in article 'downloads' from JACS at Caltech, for example, borders on the phenomenal. Data from a continuing journal use study (that counts check-outs, re-shelving in-house use, and staff photocopying) indicated that JACS (and this is for all years) was 'used' over 6300 times in 1997 and 6200 times in 1998. Caltech signed up for the ACS Web Editions Plan B in the second quarter of 1998 and saw over 5000 electronic downloads of JACS by the end of the year. In 1999, the traditional (print) use of JACS dramatically decreased to about 4000 uses, and, as you might suspect, the electronic use increased, now totaling over 9000. In the year 2000, the traditional use remained essentially constant but the electronic use increased to over 20,000 pdf downloads. (Slide 1)

Slide 1: JACS 1997-2000 Use



	1997	1998	1999	2000
Electronic Fulltext Use	0	5385	9108	20473
Document Delivery Use	435	634	292	281
Internal Use	5858	5482	3634	3547
Checkout	74	70	33	13

There are obviously a variety of explanations for this data. We assume that the traditional use will remain essentially constant in 2001, reflecting the use of older non-electronic material. Electronic use may also level off, assuming the results of cancellation of personal subscriptions have been incorporated in in the 2000 figures. One might think that personal subscriptions would have accounted for a substantial number of out-of-library uses, before the ACS Plan B, that wouldn't have been included in the Library's 1997 & 1998 figures for traditional (print) use. However, the total number of subscriptions to JACS, at Caltech, only decreased from 27 in 1998 to 18 in 2000, but increased to 19 in 2001.

Looking back on these use patterns, I thought it would be interesting to search the CHMINF-L Archive for messages related to my early thoughts on the ACS Web Editions. The first, posted in May 1998, went as follows:

"I underwent something like an ephiphany at the Dallas ACS meeting after meeting with Susan Barclay, the Product Manager for Electronic Editions. The ACS Plan B, especially for academic libraries, really meets us more than half way and is something all chemistry libraries should have. I reconsidered my initial concerns because the ACS electronic product has

real added value. Not only do we, on the West coast, no longer have to suffer a week long delay in accessing the most recent issue but papers are now posted on the journal's web page immediately after they are accepted for publication. These articles are later combined into a traditional issue. I came away from Dallas with the feeling that, even if it meant cancelling one of the 'high priced' journals, we simply had to have the ACS Plan B package."

On reflection, the very rapid acceptance of electronic journals should not have been surprising. Quoting from Tenopir and King's new book, 'Towards Electronic Journals', "The entire scientific scholarly journal system in the U.S. currently expends about $45 billion in a year (exclusive of subscription costs). The majority of these expenses coer the time associated with authorship and reading by researchers (87%). Publishers account for about 7% and libraries and other intermediary services about 6%.

Given this enormous cost, anything we can reasonably do, as librarians, to minimize the time and effort researchers expend on identifying, locating, and acquiring information is an absolutely essential

goal. High quality – Hi Impact electronic journals (such as those from the ACS and RSC) and comprehensive electronic databases (such as WoS, SciFinder Scholar and Beilstein Crossfire) are extremely helpful in this regard. However, Librarians continue to face a variety of barriers, in providing access to other journals and databases, which are very difficult to explain to our user community. In a sense, librarians and their users have been spoiled by the relative ease of access to major society publications. The access and delivery standards maintained by the ACS and RSC, for example, are enormously appreciated by the scientific community and will, I feel, have a profound effect on their choices for publication in the future.

Most of the barriers librarians face in attempting to meet the goal of minimizing the time and effort of its users are related to access. These barriers begin with licensing and bundling, and continue with pricing, 'copy of record' confusion, archiving & format durability, marketing confusion, and institutional cataloging.

The point of view of a typical 'harassed' librarian is well expressed by the following quote from my former colleague, Stella Ota, who is now at Stanford.

“Librarians get to show people the nice front end part, where they click and go. Meanwhile, we librarians are also looking at the identification, ordering, order tracking, order status, license receipt, license negotiation, new license, no license, publisher changes, platform changes, roxy access, proxy access for AOL and Earthlink users, proxy access from abroad, campus access points, access point maintenance, site is down, site is back up, viewing and printing in Postscript vs LaTeX vs HTML vs PDF, viewing and printing in color vs black & white, ad infinitum.” The tools that make identification, ordering, cataloging, accessing, preservation, etc., easier for more established formats are not there yet for electronic journals. We work for users to have 24/7 seamless access at point of need. That’s more challenging than having the book on the shelf during open hours. We’re dealing with a new medium that lacks the support systems of jobbers or vendors or what have you and we’re dealing with expanded time demands. While we continue to struggle with copyright, licensing, archiving, and our digital future, all of which are extgremely important to our continuing success as research institutions, what are we not doing and when will it hurt us?”

License negotiation is a major stumbling block, especially for smaller institutions that do not have an extensive legal and professional staff. For that matter, many small publishers don't have the staff either. Librariand and publishers simply don't have the resources to negotiate separate agreements in a timely manner. This necessarily results in prioritizing, which generally has an adverse effect on smaller publishers. Given the importance of establishing an electronic presence, why don't publishers simply offer free electronic access to their print subscribers, under the current copyright laws, while the formal licensing and pricing issues are being resolved. A further problem in this regard, which has been pointed out by Bob Michaelson (4) and Ken Frazier(5), is the bundling of subscriptions (especially those from commercial publishers). This often forces subscribers to accept a very uneven distribution of product quality and the process, in libraries, for justifying this approach causes substantial delays and user frustration.

Cost containment, which could be greatly improved by the migration of conference papers to preprint servers as suggested by Ken Rouse (6) is absolutely essential. The suggestion by a commercial publisher that is it reasonable to could their subscription rates in a 7-10 year cycle is

untenable. I think that there will have to be a trade-off between the institutional costs for computer workstations, servers, printers, etc., and journal subscriptions. This will demand that only the highest quality papers be formally published in the traditional peer-review process.

The ‘Copy of Record’ confusion is especially troubling given its appearance in commercial journals. Recent examples include on the exclusion of obituaries, memorial articles, notes, errata and retractions (in Science Direct), feature sections such as “The JAL Guide to the Professional Literature”, in the Journal of Academic Librarianship, and books reviews in the ‘electronic version’ of Angewandte Chemie. These unfortunate practices not only mean that some electronic records remain uncorrected and incomplete, but that the ‘full record’, in services such as WoS, Medline and Chemical Abstracts is dependent on the indexing and abstracting of the print issues.

Archiving Issues ... are especially controversial. In my lifetime, I have personally seen the production of the printed page evolve from hand-set type and Linotype machines to photocomposition, punch-cards, Com-fiche and finally to the electronic typesetting we enjoy today. Given these

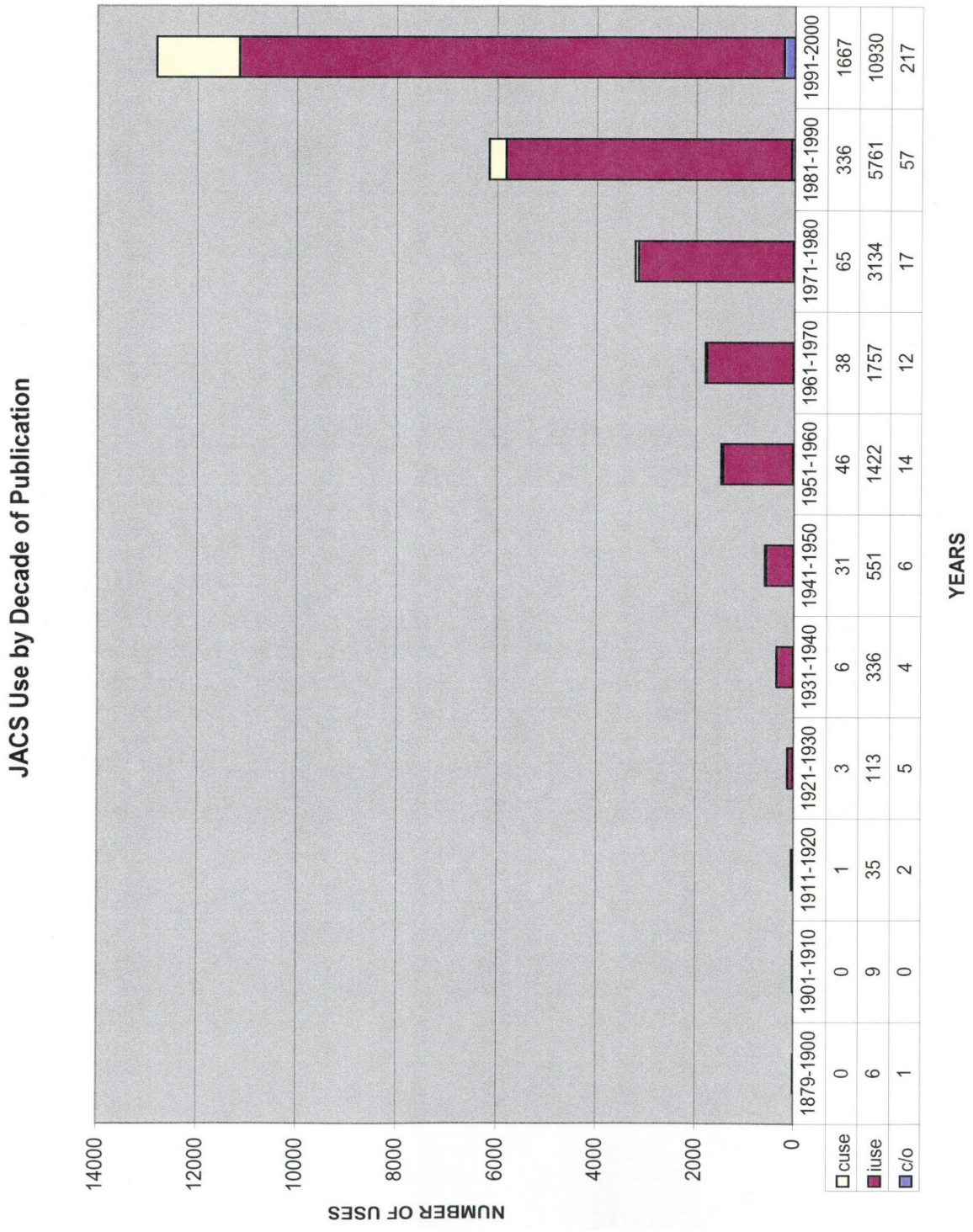
relatively rapid format changes, one could suggest that, as conservative organizations, libraries should maintain print subscriptions, at least thru the next major format migration. On the other hand, the recent announcement by the American Physical Society (7), that they are: 1) making the electronic version of their journals the 'copy of record' and 2) will soon be establishing mirrored electronic archive sites with Cornell University and the Library of Congress, suggests that traditional print issues may very soon be unavailable. The issue of retrospective electronic archiving is another case of unchartered waters regarding investment of time and effort. Caltech added new professors in both organic and inorganic chemistry last summer and I took this opportunity to audit their winter term upper division/graduate level courses. Each lecture was referenced with the most important research papers on a wide variety of topics.

Slide 2: Ch242 – Chemical (organic) Synthesis: Distribution of Assigned Articles.

While I probably should have known better, I was a little surprised to see such a large percentage of literature reference references to JACS and other ACS titles. Out of 116 articles assigned in this organic synthesis class, JACS accounted for 39% of the articles, Accounts of Chemical Research & Chemical Reviews for 15%, JOC & Organic Letters for 11%, while the Tetrahedron family accounted for only 13%. This quality assessment for JACS is further substantiated by the fact that 4 of the most cited articles reorting new organic synthesis techniques from 1985 thru 1996 came from JACS and the 5th was from JOC (8).

Slide 3: Ch153 – Advanced Inorganic Chemistry: Distribution of assigned articles.

In the advanced inorganic chemistry class, JACS accounted for 27% or the articles, Inorganic Chemistry & Organometallics for over 23%, Accounts & Chem Reviews for 9% and the J. Chem. Soc. family for 9%. Commercially published journals, however, only accounted for 21%, with Science Direct journals accounting for only 6%.



Slide 4: JACS: Print volume use by decade: 1996-2000

The use of JACS (in print), over the five year period from 1996-2000, at Caltech, shows that 90% of the use is from volumes published after 1960 and 95% of the use from volumes after 1950. In this regard, I am very skeptical about the value of retrospective electronic archiving of society published journal articles prior to 1960 and, with the possible exception of Angewandte Chemie & Tetrahedron Letters, any commercial journals. I would much prefer to see commercial publishers focus on electronic archiving of their encyclopedic works, such as the Comprehensive series from Pergamon/Elsevier and Organic Reactions & Organic Syntheses from John Wiley.

In this regard, Declan Butler (9) in his introduction to Nature's annual journal review issues last September, suggested that, and I quote ... "the plethora of print journals is doomed to extinction; it makes no economic sense and is increasingly a hinderance to science itself. Not all print journals will disappear. Journals whose content can command a large readership will continue to exist, and indeed fluorish, in print, as their economics are akin to those of the magazine market." Butler goes on to point out that "the essential function of a journal is to serve a particular

community. The next web revolution will be a plethora of next-generation communities linking papers, people and data."

This, I think, will be the evolution of many of today's low circulation journals and e-prints, namely into web based forums for exchanging information with only the most significant research results being submitted to the high quality society journals, that, I would suggest, also require preservation in print. Given the dramatic improvements in ILL functions, I would be comfortable giving up the print issues of Physical Review or JACS tomorrow, if there was a commitment to maintain a small network of depository libraries to insure their millenial permanence (10). This, I think, may be a crucial step before many librarians are comforftable with electronic-only subscriptions for the highest quality journals. While the ease of transmitting files and the reliability of networked servers would seem to make a print depository unnecessary, the 'librarian' in me expects it. An additional possibility during the transition between low circulation journals and web based forums, is for abstracting/indexing database producers to archive electronic versions of the journal articles they index. This seems like a more logical solution to the problem than to depend on commercial journal publishers.

Problems with access ... are generally related to login/password access – which has obviously become archaic – and the pernicious practice of changing URL addresses without either appropriate notification or simple forwarding. Commercial firms and societies that are guilty of these faux paus are sending a very strong message, to their subscribers, that suggests they are on the verge of either monetary or creative bankruptcy.

Marketing confusion ... is best exemplified by the current state of disarray, in the minds of many librarians, related to Science Direct, Science Direct Web Editions and corresponding offerings on ChemWeb and BioMedNet. Further confusion arises from marketing efforts, directed at personal subscribers, that often result in individuals coming to the library expecting electronic access to journal on the basis of an institutional (print) subscription whose electronic version has not been licensed.

Institutional cataloging ... problems are often overlooked by many publishers. This has resulted in both faculty and students being completely unaware that electronic access is available for a particular journal. Cataloging staffs in academic libraries were initially very reluctant – on the

basis of workload issues due to the volatility of URLs – to revise OPAC records indicating electronic availability. This reluctance was overcome in some cases by adopting a policy that amended OPAC records only for paid and licensed journal subscriptions. This had the unfortunate consequence of penalizing publishers, in at least one significant case, that offered free access with a paid print subscription. As a result, some public service librarians have developed Online Journal Databases (12) that are OPAC independent, and only provide brief records, obviating the need for arbitrary restrictions on the addition of new titles.

The use of electronic journals at Caltech has been both phenomenal and instructive. While use statistics can be difficult to obtain from commercial publishers, society stalwarts such as the ACS and RSC have set a standard of excellence in their provision. The overwhelming use of PDF copies, at Caltech, might suggest that many users simply use electronic journals as a substitute for walking to the library and photocopying articles of interest. This suggestion, however, ignores the ease with which users can now maintain current awareness. The ACS' ASAP service, for example, and e-mail alerting services such as those from

the RSC, mean that researchers, anywhere in the world, are only one click away from the most current high quality literature.

It is important to think of journals as containers in the river of knowledge and that, if a journal is not moving with the stream, it necessarily will wind up in a backwater and be effectively marginalized out of existance. In the print era, the communication efficiency of scholarly journals has been dependent on affordability and the worldwide redundancy of print subscriptions. In the electronic era, it will also be crucially dependent on ease of access. Dissemination of manuscripts will increasingly be less dependent on the journal 'container' and begin shifting to an individual's research interests. Given the possibilities for infinite differentiation, virtual journals (13) may actually revitalize personal subscriptions for nearly everyone. The future of scientific journals was questioned in a more philosophical way, by Michael Engel, on the CHMINF-L listserv (14). Engel wonders if we are approaching the time when individual journal titles will no longer matter and that it will be the society of commercial publisher name that will be the imprimatur. This obviously anticipates a dramatic expansion of the 'virtual journal' concept that is being pioneered by the APS. Engel goes on to foresee extractable publications that could be easily searched,

presumably obviating the need for Chemical Abstracts. This, in a sense, appears to be an element in the marketing of Science Direct. While the Chemical Abstracts Service provides an enormous added value, especially in the area of compound searching, the current pricing structure, especially in academe, keeps them in constant danger of being marginalized. A further concern about CA is their reliance on the ChemPort linking technology. ChemPort linking is a 'stealth' issue in the sense that, while it seems to be a serviceable product, it is on a non-sustainable level. Providing links to full-text journals, that a given library does not have access to, is not a long range solution. I don't have time to describe SFX, which is licensed thru Ex Libris (15), in this talk, but would strongly encourage you to seriously consider its benefits. These benefits are, in essence, that each library is able to customize electronic links for its users from all of its licensed database services with a minimum investment of labor.

Finally, journal publishers who pursue imaginative licensing of their product and database producers who take advantage of creative linking opportunities will prosper, because they will become more widely known

and used. Those that remain relatively intransigent, and only reactionary to change, will likely face away.

References:

1. Douglas, K., Roth, D.L., 'TOC/DOC: "It Has Changed the Way I Do Science" '. Sci. Tech. Libr., (1998), 16(3-4), 131-145.

2. Roth, Dana L., 'ACS Electronic Journals'. CHMINF-L Listserv, (1998), May 8. https://list.indiana.edu/sympa/arc/chminf-l/1998-05/msg00031.html

3. Tenopir, C. and King, D.W., 'Towards Electronic Journals: Realities for Scientists, Librarians and Publishers. Special Libraries Association, (2000). Reviewed by Simon B. Shum: http://www-jime.open.ac.uk/articles/10.5334/book-tenopir/

4. Michaelson, R., 'The Big Issue – The Future of Electronic Publications'. Newsletter on Serials Pricing Issues, (2000), 254.2, http://webdoc.sub.gwdg.de/edoc/aw/nspi/2000/2000-254.html

5. Frazier, K., ‘The Librarians' Dilemma: Contemplating the Costs of the "Big Deal".’ D-Lib Magazine. (2001), 7(3). http://www.dlib.org/dlib/march01/frazier/03frazier.html

6. Rouse, K., ‘Making chemistry papers available on the web’. Letters to the Editor. Chronicle of Higher Education, 2000, Oct. 13, p. B17. http://www.chronicle.com/article/Making-Chemistry-Papers/18459

7. American Physical Society Press Release. ‘Library of Congress to begin its first e-archive’. Dec. 13, 2000. https://journals.aps.org/loc.html

8. Clark, M., ‘Synthetic chemical literature’. J. Chem. Inf. Comput. Sci., (1999), 39, 635-637. http://pubs.acs.org/doi/abs/10.1021/ci990001e

9. Butler, D. ‘Is your journal really necessary’? Nature (2000), 407, 291. http://www.nature.com/nature/journal/v407/n6802/full/407291a0.html

10. Roth, D. ‘Electronic Archiving’. Newsletter on Serials Pricing Issues, (2000), 249.3. http://webdoc.sub.gwdg.de/edoc/aw/nspi/2000/2000-249.html

11. Monastersky, R. ‘In a First, a Species is Named in an Electronic Publication’. Chronicle of Higher Education, (2000), Nov. 15. http://www.chronicle.com/article/In-a-First-a-Species-Is-Named/105266

12. Porter, G.S., Sponsler, E. ‘Online Journals: Utility of ToCs vs. Fulltext’. In: Crossing the Divide: Proceedings of the Tenth National Conference of the Association of College and Research Libraries, pp. 110-119. http://authors.library.caltech.edu/25885/

13. AIP/APS Virtual Journals are an excellent example. https://www.aps.org/publications/apsnews/200001/virtual.cfm

14. “Will journals have a place in the future?” chminf-l 17 Nov. 2000. https://list.indiana.edu/sympa/arc/chminf-l/2000-11/msg00159.html

15. SFX (Software). https://en.wikipedia.org/wiki/SFX_(software)